NASA Vision
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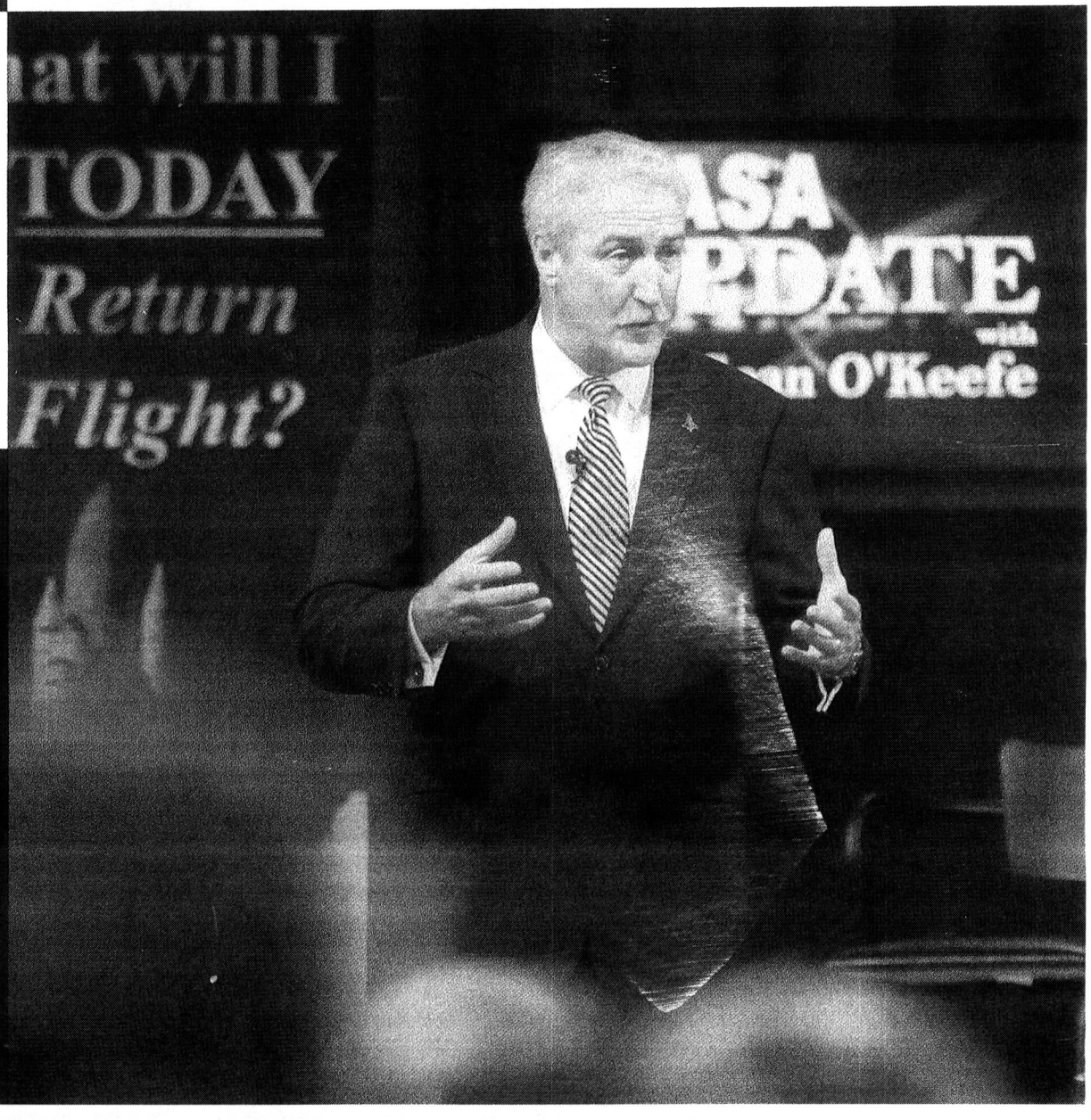
VISION

Administrator O'Keefe Addresses NASA's Return to Flight

During the latest NASA Update broadcast, held at NASA Goddard Space Flight Center, NASA Administrator Sean O'Keefe described NASA's Return to Flight activities before the entire Agency, as well as answered questions from employees at each Center.

Photo credit: NASA/Bill Ingalls



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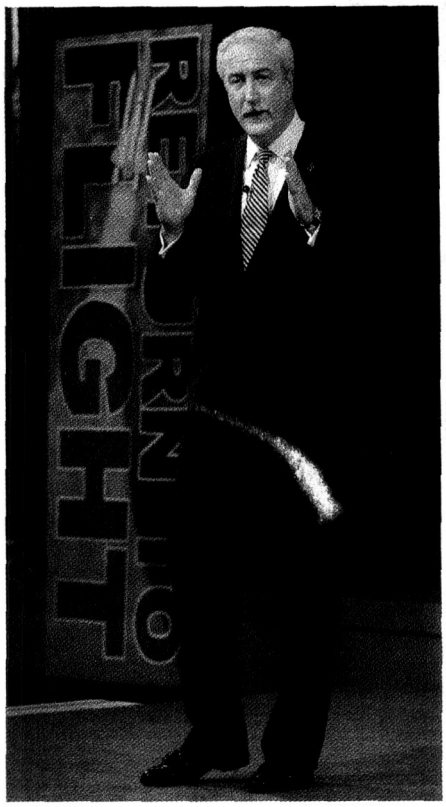

Photo credit: NASA/Bill Ingalls

With the release of the Columbia Accident Investigation Board's (CAIB) final report just a few weeks away, I believe the Agency needs to prepare for stern criticism and the challenge we face. I'm convinced that in responding to these challenges, we will only prove our strength and capabilities, as we honor the memory of the heroic crew of the Space Shuttle Columbia by continuing their mission — human spaceflight.

The CAIB report will offer widespread assessment of our Agency. We must accept their findings, concentrate on how to fix the problems and not argue about the details. In responding positively to their recommendations and by raising the safety bar even higher, we will become a stronger, better Agency. I urge you to wake up every day thinking "what will I do today to help return to safe flight?"

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If we all participate in this effort, making the necessary contributions large or small, direct or indirect, we will all help define who we are and what we can do. With the cooperation of every NASA employee, the Space Shuttle Atlantis could be headed for the International Space Station by next spring.

Our history has been filled with great successes and tremendous losses, but everything we do, we do in the spirit of exploration and recognizing that exploration is not risk-free. Exploration leads us to amazing discoveries and advances, and with everyone's participation, we will continue human exploration beyond the bounds of Earth's atmosphere.

Tools to improve our procedures and processes, like the new Independent Safety Office at NASA Langley Research Center, will be designed to bolster our current systems and methods, enabling us to continue with human spaceflight operations that are as safe as humanly possible.

Finally, NASA needs to intensify its efforts to ensure anyone with even the smallest safety concern feels comfortable — compelled, even — to step forward and point out that issue. We need to make it easy for anyone to voice their concerns because we not only need to know, we must know to enable the level of safety and reliability we demand.

VISION

NASA Vision

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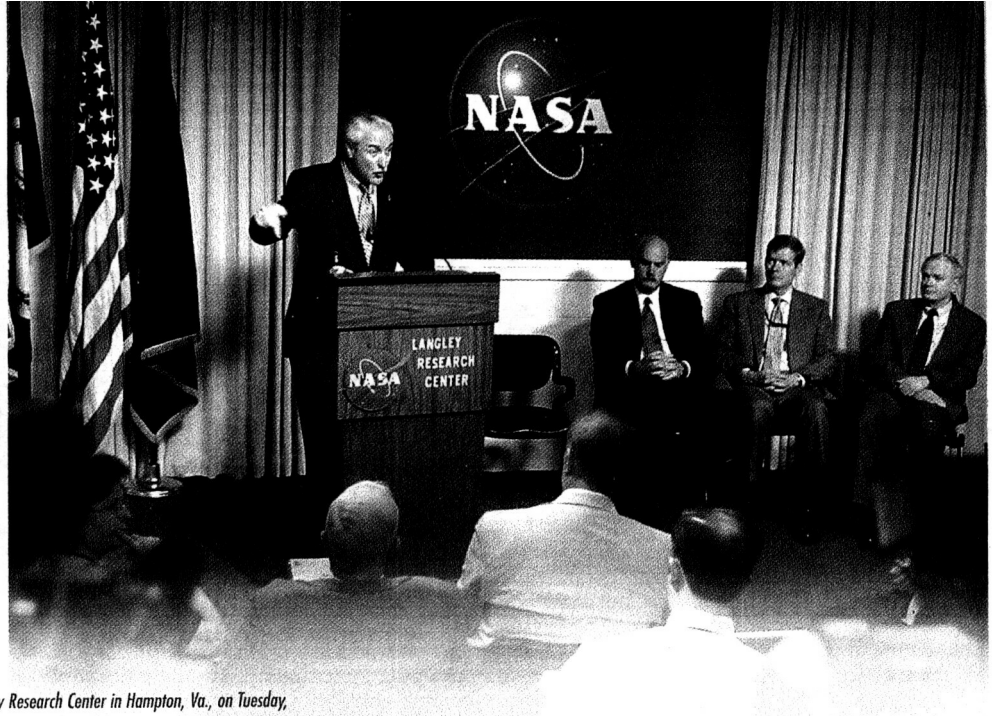
New Independent **Engineering and Safety Center**



NASA Administrator Sean O'Keefe visited Langley Research Center in Hampton, Va., on Tuesday, July 15, to announce the creation of the NASA Engineering and Safety Center (NESC) to provide comprehensive examination of all NASA programs and projects. The center, which will be located at Langley, will coordinate and conduct robust engineering and safety assessment across the entire Agency. (l to r): Bill Readdy, Associate Administrator for Space Flight; Bryan O'Connor, Associate Administrator for Safety and Mission Assurance; Roy Bridges, incoming Center Director at NASA Langley Research Center.

Photo credit: NASA LARC/Jeff Caplan

NASA announced plans to create an independent Engineering and Safety Center (NESC) at NASA Langley Research Center in Hampton, Va., to provide comprehensive examination of all NASA programs and projects. The center will provide a central location to coordinate and conduct robust engineering and safety assessment across the entire Agency.

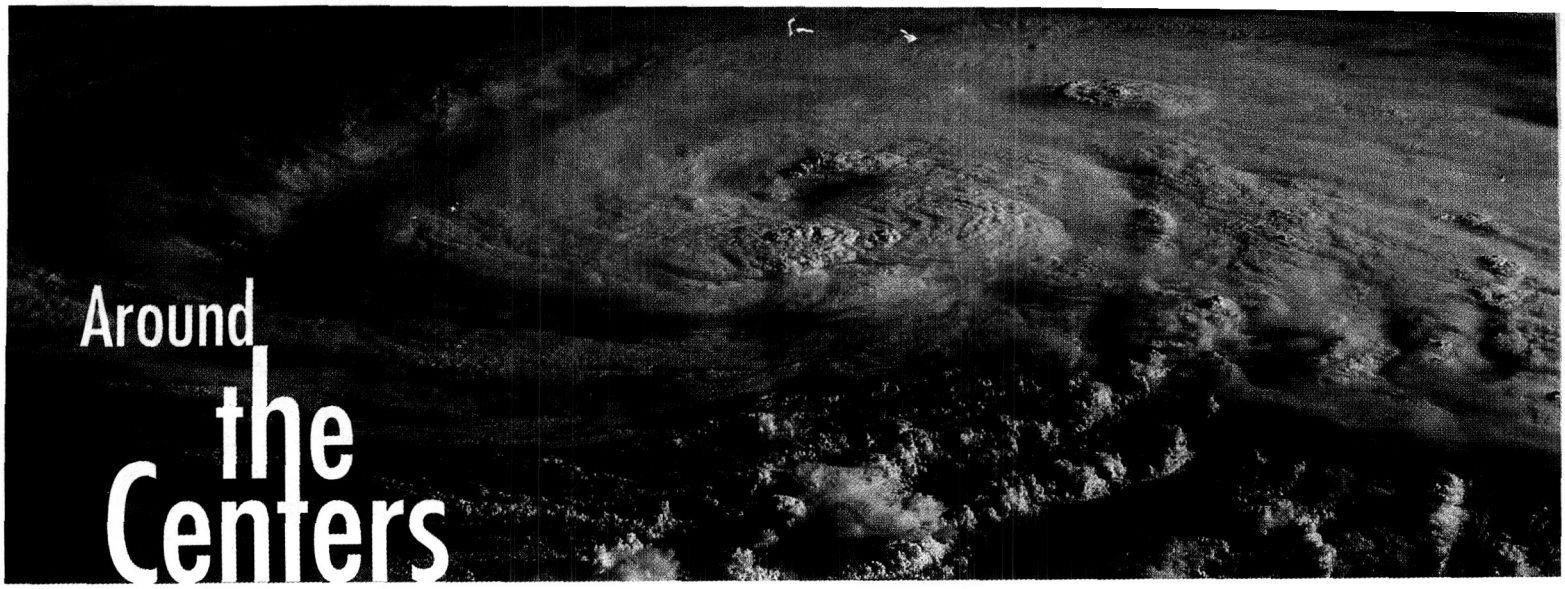
"Among the things we've learned during the investigation of the Columbia tragedy is the need to independently verify our engineering and safety standards. The new NASA Engineering and Safety Center will have the capacity and authority to have direct operational influence on any Agency mission," said NASA Administrator Sean O'Keefe.

The NESC is expected to draw on the talents of about 250 people throughout NASA and will report to former Astronaut General Roy Bridges, Langley Center Director. Bryan O'Connor, also a former astronaut and Associate Administrator for Safety and Mission Assurance at NASA Headquarters in Washington, will have policy responsibility for the organization. O'Connor's task will be to assure the effective use of all Agency assets and expertise to derive the independent assessments.

"As we move forward with our 'Return to Flight' efforts, the development and implementation of the NESC will help us focus on the future of our technical and safety imperatives," said O'Connor. "We have a responsibility to make our programs as safe and as sound as possible. This project raises our commitment to unprecedented levels."

Planned activities of the new organization include independent engineering assessment and testing to support critical NASA projects and programs; engineering and safety review and evaluation through independent analysis, hazard and risk assessment, safety audit and participation in mishap investigations; a central location for independent trend analysis utilizing state-of-the-art tools and techniques; a structure to support engineering collaboration for problem resolution; central coordination of engineering and programmatic lessons learned, technical standards and technical discipline expertise; and independent inspection and validation of activities to ensure the constant maintenance of NASA safety standards.

"We need to go further than what we expect to see in the findings of the Columbia Accident Investigation Board (CAIB)," added Dr. Michael Greenfield, Associate Deputy Administrator for Technical Programs at NASA Headquarters in Washington. Additional information about NASA and Langley is available on the Internet at: www.nasa.gov



Around the Centers

AMESresearchcenter

As NASA's Mars Exploration Rovers journey toward the red planet, a group of 36 high school students are honing their engineering and computer skills this summer during a seven-week, intensive course called RoboCamp. The course is sponsored by NASA Ames Research Center and Carnegie Mellon University, Pittsburgh, Pa., and is being held at the school's west coast campus at NASA Research Park adjacent to NASA Ames. Students, some of whom may someday work in future space missions, are building three-wheeled, two-foot-tall robots that will have various sensors including video cameras and range finders.

GODDARDspaceflightcenter

In the spirit of "to inspire the next generation of explorers . . . as only NASA can," the GSFC Public Affairs Office is beginning a new community outreach program called "Space Chats," a series of free events that will allow the public to experience interactive presentations about current GSFC programs and research. Some of the first topics will include a presentation called "Coming Soon to a Galaxy Near You" about the James Webb Space Telescope and "Can Cities Create Their Own Weather?" about how "urban heat islands" create more summer rain over major cities. More information on "Space Chats" is available at: www.gsfc.nasa.gov

JETpropulsionlaboratory

With the upcoming launch of the Space Infrared Telescope Facility, project representatives are giving kids and adults a sneak preview of the wonders of infrared. Through a Pasadena City College NASA Minority Initiative Grant, an infrared camera is visiting local classrooms. Last year, the program reached 10,000 students. The camera also wowed visitors at the Jet Propulsion Laboratory's recent Open House, and will be part of the Cosmic Origins museum exhibit, which begins a three-year national tour in 2005.

KENNEDYspacecenter

James W. Kennedy was named the new Director of Kennedy Space Center (KSC) on June 26. Kennedy has served as KSC's Deputy Director since November 2002. Kennedy will succeed Roy Bridges, Jr., who was appointed to lead NASA's Langley Research Center, Hampton, Va., June 13. Prior to his assignment to KSC in 2002, Kennedy was Deputy Director of NASA George C. Marshall Space Flight Center in Huntsville, Ala. Kennedy also served as project manager for major initiatives, such as the X-34 and the DC-XA, and he led the One NASA effort to help make the Agency more effective and efficient by encouraging teamwork across all Field Centers.

LANGLEYresearchcenter

"NASA CONNECT," the TV series produced by Langley Research Center's Office of Education, won a regional Emmy Award at the 34th Cleveland Regional Emmy Awards ceremony. The episode won in the Children/Youth Programs category. In the episode, students learn about microgravity and are introduced to combustion science and the importance of fire safety on the International Space Station. Funding for this segment was provided by the Office of Biological and Physical Research. The award is the ninth Emmy for the educational series.

JOHNSONspacecenter

In a display of patriotic pride, hundreds of Johnson Space Center (JSC) employees dressed in red, white and blue for an aerial photo on July 2. Employees spelled out NASA in JSC's Rocket Park. The pictures can be viewed at: www.jsc.nasa.gov/people/images/nasapeople1.jpg

As a 40th birthday surprise for Expedition Seven Astronaut Ed Lu, JSC Director Jefferson D. Howell, Jr. proclaimed July 1 as "Aloha Shirt Day." Pictures of employees wearing aloha shirts were taken by JSC photographers and sent to the Expedition Seven crew members to show them our support. "I can't think of a better place to be on my 40th birthday," Lu said. Lu considers Honolulu his hometown and has a great fondness for Hawaiian aloha shirts, frequently wearing one on orbit aboard the International Space Station. In honor of his big day, Hawaii Gov. Linda Lingle proclaimed July 1 as "Edward Tsang Lu Day" in Hawaii. Aloha Day pictures can be viewed at: www.jsc.nasa.gov/jscfeatures/articles/000000021.htm

MARSHALLspaceflightcenter

"International Space Station: The Earth Tour," a new 5,000 square-foot, interactive exhibit is premiering in Birmingham, Ala., this summer. Over the next six years, it will travel to venues across the United States and is expected to attract as many as 5 million visitors. The new exhibit, on display in Birmingham until Sept.1, 2003, is at the McWane Center — a science center specializing in hands-on exhibits. McWane is collaborating with the Marshall Center on the space station exhibit. Visitors can step aboard high-fidelity replicas of space station modules and laboratories, experiencing life in orbit from lift-off to landing. To highlight Alabama's contributions to the International Space Station program, the Marshall Center is sending exhibits about station hardware, and NASA has scheduled experts to talk at the museum during selected weekends this summer. For more information on admission to McWane Center, the exhibit and the space station, go to: www.scipoc.msfc.nasa.gov

STENNISspacecenter

This summer Stennis Space Center (SSC) hosted the first annual Mississippi Robotics Consortium. Community and education leaders from across the state attended a meeting at SSC to learn how schools, community and industry could partner in the For Inspiration and Recognition of Science and Technology (FIRST) Robotics competition. This meeting was an opportunity for the various team representatives, and those who foresee themselves supporting a team in the future, to come together and share experiences, ideas and efforts. The meeting also gave participants information about how to successfully support or start a FIRST Robotics team with the goal of building greater teams in the future.

(image above): The crew of the International Space Station had a great seat from which to observe tropical storm Claudette as she turned into a hurricane and came ashore with high winds and heavy rains that drenched their Houston home base and other Texas areas. This digital image was recorded at 13:26:41 GMT, July 15.

NASA @ your library

Local Libraries Making Room for Space

NASA and the American Library Association (ALA) have partnered to create a one-of-a-kind interactive space research exhibit as part of a new program called NASA @ your library. The program launched July 1 at the Enoch Pratt Free Library in Baltimore.

NASA @ your library was created to inspire more participation at public libraries, raise awareness and encourage interest in science. The unique exhibit will tour 120 public libraries in five regions across the nation during the next two years. It will feature special presentations specifically created to expose people of all ages to NASA research in the areas of health, home and transportation, agriculture and environment, and commerce.

As of July 1, the exhibits opened in libraries in Tacoma, Wash.; Reno, Nev.; Overland Park, Kan.; and Spartanburg, S.C.; as well as at the Enoch Pratt Free Library in Baltimore.

The exhibit is self-contained and comes complete with six desktop computers and workspaces. The main interactive exhibit includes topics on Space Shuttle operations; living, working and conducting space research on board the International Space Station; and information on future aerospace activities. Apple Computer, Inc., is contributing 36 new Way Cool Flat Screen computers to the exhibit and funding the movement of the exhibit throughout the U.S.

NASA @ your library is part of The Campaign for America's Libraries, a multiyear public education effort sponsored by the ALA to speak loudly and clearly about the value of libraries and librarians in the 21st century. The campaign is designed to showcase the unique and vital role played by public, school, academic and special libraries across the United States. NASA is the latest founding partner in the campaign. Invitations to participate in the program were sent to over 16,000 public libraries throughout the U.S. Libraries are being selected to participate in the tour based on criteria established by the ALA.

For more information on the exhibit, visit: www.ala.org/nasa

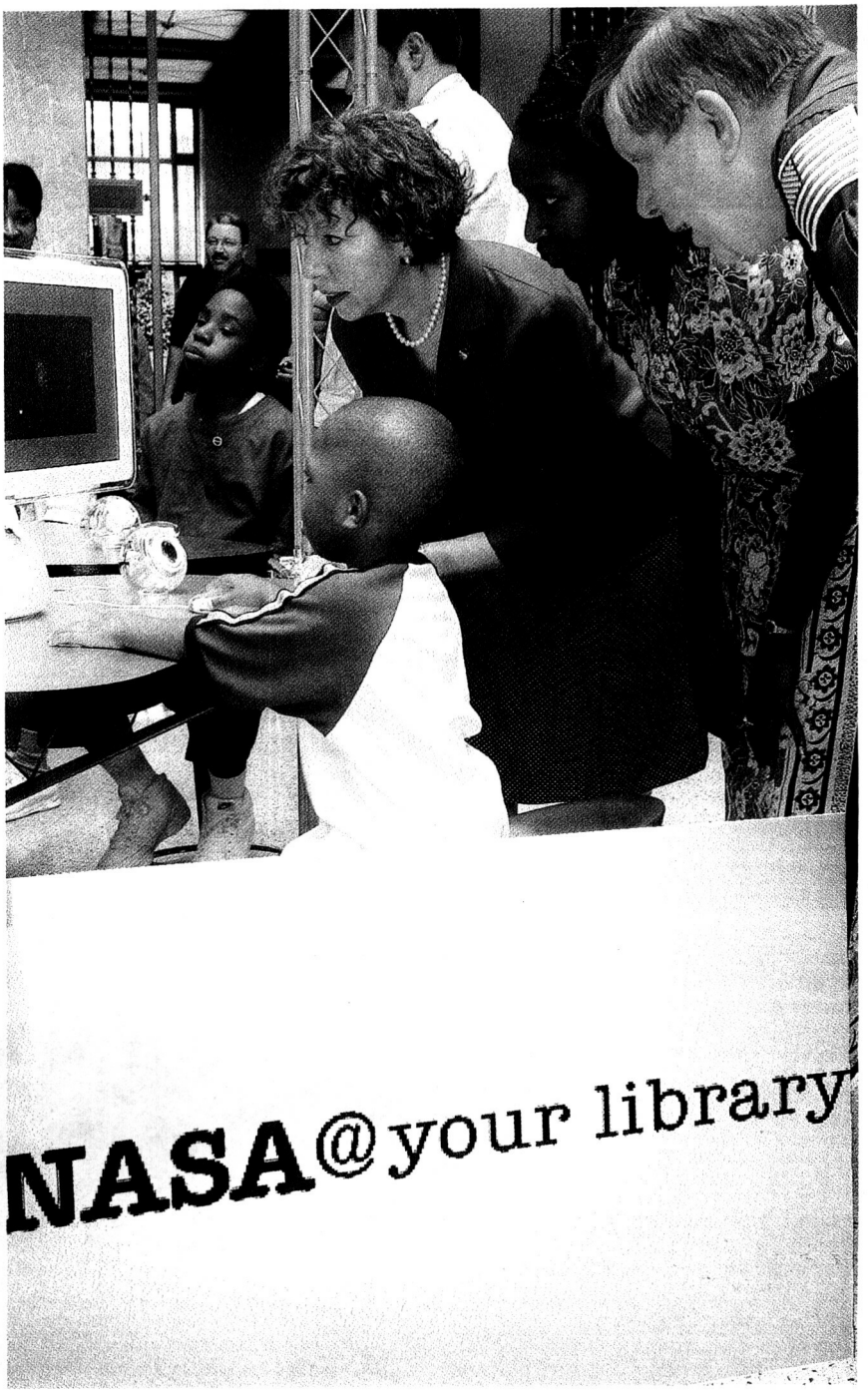


Photo credit: NASA/Bill Ingalls


Robonaut:
The Next
Generation

The Robonauts, with their highly dexterous hand design, can work with the same tools humans use.

Humans and robots worked side-by-side this summer at NASA Johnson Space Center (JSC) in Houston to evaluate the concept of using human-robotic teams to improve the productivity of the astronauts working outside the International Space Station, other space vehicles or on the surface of other planets.

"We like to think of these as 'EVA (extravehicular activity) squads' — humans outside the spacecraft in space suits, dexterous robots, humans inside the spacecraft or on the ground teleoperating robots, free-flying robots, giant crane robots — all working together to get the job done," said Test Conductor Dr. Robert Ambrose of the JSC Engineering Directorate's Automation, Robotics and Simulation Division.

"The EVA work done now uses two astronauts, backing each other up, with help from astronauts inside and a large robotic arm outside," said Ambrose, who also manages the Robonaut Project that supplied two dexterous humanoid robots for the test. The new Robonaut, a collaborative effort with the Defense Advanced Research Projects Agency, also known as DARPA, has been under development at JSC for the last several years.

Astronaut Nancy Currie stepped into an advanced concept space suit to participate in the test as the squad leader. The task at hand was to assemble an aluminum truss structure. Currie and her Robonaut companions assembled the truss several times, significantly cutting the time required to complete the task on each run.

After the structure was assembled, the team installed electrical cable, with the Robonauts taking the cable out of its package and routing it around the truss to Currie, who connected it to the truss using a standard EVA electrical connector and wire ties. To wrap up the test series, they simulated what would happen if a hazardous chemical contaminated Currie's space suit, with Currie using a special brush to remove the make-believe chemical and then handing the brush to a Robonaut to clean the places she couldn't.

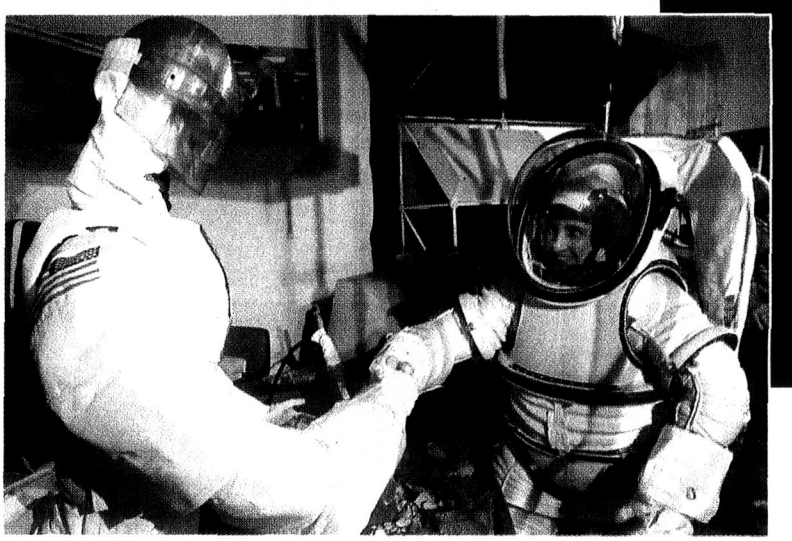
Currie wore an advanced-concept space suit designed for use on other planets. The suit is half as heavy as a standard shuttle Extravehicular Mobility Unit (EMU) and easier to maneuver in Earth's gravity. The "I-suit," developed for NASA by ILC Dover, Inc., is one of several different advanced space suit assemblies being used to compare the relative merits and liabilities of various suit components.

"I think it went great," Currie said of the test series. "In the next five years, when we think about EVA, we're going to think in terms of sending out squads. If you look at an EVA timeline, about 20 percent is worksite setup and closeout, getting tools ready and managing tethers." Robonauts could help reduce that time, making an astronaut more productive or cutting the amount of time the astronaut has to be outside in a hazardous environment.

The Robonauts, with their highly dexterous hand design, can work with the same tools humans use. For these tests, the Robonauts used standard EVA tools, such as ratchet wrenches, retractable tethers and socket caddies. In the future, a Robonaut could work like a nurse in an operating room, where an EVA crewmember, like a doctor, would ask the nurse for a particular tool and have it placed in his or her hand.

Robonauts of the future could be used for a variety of jobs, including assembly of orbital telescopes, remote Earth observatories and interplanetary transit vehicles, all of which could require work beyond low Earth orbit.

For more robot images, visit the gallery at: spaceflight.nasa.gov/gallery/images/station/eva/robonaut/ndxpage1.html



Astronaut Nancy J. Currie, wearing a training version of an advanced concept space suit, shakes hands with a Robonaut prior to participating in a test at the Johnson Space Center to evaluate hand-in-hand work with robots. The second of the two Robonauts used in the demonstration's task — the assembly of an aluminum truss structure — is out of frame.

(image at left): Robonaut, a humanoid robot designed by the Robot Systems Technology Branch at NASA Johnson Space Center, is a collaborative effort with DARPA. The Robonaut project seeks to develop and demonstrate a robotic system that can function as an EVA astronaut equivalent. Robonaut jumps generations ahead by eliminating the robotic scars and specialized robotic tools of traditional on-orbit robotics. However, it still keeps the human operator in the control loop through its telepresence control system.

EASY ACCESS

The five award-winning educational programs are available in both English and Spanish. Approximately 400 educators nationwide have registered to use the Spanish-language programs, and more than 100 television stations are presently airing them. These programs not only present science, technology, engineering and mathematics as fun subjects, but they include appropriate role models and opportunities for career exploration.

For more information, contact Ivelisse Gilman at i.gilman@larc.nasa.gov at Langley or check out the Web sites: ksnnsp.larc.nasa.gov (Spanish) or ksnn.larc.nasa.gov (English)

Inspiring the Next Generation . . . of Hispanics

Inspiring the next generation of explorers is taking on a new flavor at the Langley Research Center. In an effort to inspire the next generation of Hispanic engineers and scientists, NASA Langley's Center for Distance Learning has designed five programs focusing on science, technology, engineering and mathematics. It's all part of the Office of Education's Hispanic Education Initiative. Their newest program will soon be seen on the largest Spanish-language network, Univision. The program is called NASA's Kids Science News Network™ (KSNN), and it's a Spanish language series of video and Web-based programs designed to turn kids in grades K–2 and 3–5 on to the excitement and fun of science, technology, engineering and mathematics as only NASA can. NASA's KSNN™, or Noticiencias NASA in Spanish, features Hispanic children explaining science, technology, engineering and mathematics and facts about NASA to other kids in an entertaining and instructional format.

Ivelisse Gilman, who manages Langley's Hispanic Education Initiative, said, "It has been very fulfilling to reach out to the next generation of Hispanic engineers and scientists." Gilman translated and rewrote many of the program's segments to ensure that the project was culturally and linguistically appropriate. She also had a hand in finding the young, cute, on-camera talent, "They were so excited about learning and sharing their new knowledge," says Gilman. The one-minute newsbreaks build on children's natural curiosity, explain the everyday phenomena of our world, correct misconceptions and answer frequently asked questions about Earth and beyond.

NASA and Teachers Focus on Parks

NASA satellite images and expertise will help students working on a National Park Service project to study environmental change in the mid-Atlantic and northeast region.

Cape Cod National Seashore is the "Prototype Park" to evaluate NASA satellite images and other data to see global, regional and local environmental change in the area. This summer marks the second year of a three-year project focusing on four major ecosystems: beaches and dunes, salt marshes/estuaries, uplands (lands away from the ocean, not influenced by tides) and freshwater systems.

Currently, teacher workshops are taking place and protocols are being established for lesson plans in geosphere, ecosphere, biosphere and hydrosphere categories of study. Professional guidance is provided by the Massachusetts Marine Educators Association of 4,000 teachers to make sure national learning standards are incorporated.

Joining the project in early fall, students will collect data in the parks and use NASA's unique educational tools to explore how Cape Cod has changed and is changing over time due to natural and human processes. NASA's Landsat satellite provides records of land use and surface type back to the mid 1970s, and newer technologies on board NASA satellites such as Terra and Aqua provide richer data than ever before. In addition, students will use National Oceanic and Atmospheric Administration (NOAA) buoys, digital cameras on the ground and on-board remote-controlled airplanes and small aircraft, and hand-held sunphotometers.

Students will have access to not only imagery, but also the science expertise NASA researchers can offer. The Earth Science Enterprise's CALIPSO satellite is sending an educator/researcher to help with the teacher workshop on air quality and sunphotometer training. Another researcher is teaching soils protocols to the teachers.

People from the surrounding community also will help gather information from the ecosystem study sites, as well as partner organizations, including the National Park Foundation, U.S. Geological Survey, the Boston Museum of Science, the National Audubon Society, and U.S. Fish and Wildlife Service.

Additionally, the project will expand as teachers establish study sites in their own individual communities. The future plan of the project includes participation from other national parks, and, in the final phase, all findings will be posted for public use on the Internet.

The eastern half of the United States shows clearly in this true-color Terra Moderate Resolution Imaging Spectroradiometer (MODIS) image acquired April 14, located on the internet at: visibleearth.nasa.gov/cgi-bin/viewrecord?25365 Sections of this image are displayed above. Prominent in the image are the mighty Mississippi River and the Appalachian Mountains, two of the most distinctive features in the eastern United States. Scattered throughout the image are a number of fires, which are marked with red dots. Considering that this is the beginning of the spring growing season in North America, the majority of these fires are likely agricultural in nature. Also visible in the image are the brilliant turquoise-blue waters of the Bahamas. The beautiful hue of the waters in this area is caused by the relatively clear, shallow waters over the Little and Great Bahama Banks, which are shelves of land that were submerged as the continental glaciers of the last ice age melted.

National Federation of the Blind Convention attendees leaving Reagan National Airport for NFB Convention on July 1. (l to r): Nona Cheeks, Franco Einaudi, John Dalton, Craig Hegemann, Tom Paprocki, Mike Ryschkewitsch, Lynda Sampson, A.V. Diaz, Mike Moore, Marco Midon, Judy Bruner, Nina Harris, Chuck Strickland, Ann Richmond.

GSFC Director Gives Keynote Address

Goddard Space Flight Center Director A.V. Diaz spoke at the National Federation of the Blind (NFB) annual convention in Louisville, Ky. He emphasized that the two groups can work together with the common goal of decreasing the isolation that surrounds those who are blind, making the universe more accessible to them.

The convention was the largest assembly of any organization of disabled people to meet this year. More than 3,000 people attended, coming from all 50 states, the District of Columbia and over 15 foreign countries. The convention was meant to allow the blind to speak to blind role models, attend informative meetings and learn about current technological developments that are improving life for the blind.

Diaz's invitation to be a keynote speaker was one step among many in the forging of a relationship between NASA and the NFB. Diaz explained the inspiration he felt from watching blind students learn about astronomy at the unveiling of a Braille book, *Touch the Universe*, which allows blind individuals to experience Hubble Space Telescope images through raised line printing.

Since then, NFB officials, along with Dr. Kent Cullers of the SETI Institute (the only blind radio astronomer in the country), have visited and toured Goddard, and a dialogue between NASA and the NFB has begun, both seeking ways to help one another.

"Together with the National Federation of the Blind, we hope to inspire blind youth to consider opportunities in science and engineering, and to engage blind and visually impaired individuals in the nation's space program by using the excitement of NASA information," said Diaz of one of the collaboration's goals.

Convention-goers, who visited the NASA exhibit booth, were able to speak to these role models, hold a model rocket, try on an astronaut glove from a space suit, listen to a NASA video and talk about NASA research and projects.

Agency Honor Awards

The Agency Honor Awards Ceremony was held at NASA Headquarters on July 9. Omega Jones from the Office of Equal Opportunity Programs performed the national anthem, while the Military District of Washington's Joint Forces Color Guard presented the colors on stage. At this year's event, NASA Administrator Sean O'Keefe presented awards to 20 groups and 46 individuals who were recognized for their extraordinary contributions to our nation's aeronautics and space programs.

Photo credit: NASA/Renee Bouchard

Summer Interns Join the NASA Team

(l to r): Kristin Short, Etta Pagani, Larisa Aranbayeva, Alan Lord, Gilbert Loston, Yolanda Bennett.

Photo credit: NASA/Bill Ingalls

Kristin Short — Hometown: Dunkirk, Md. Senior, Washington University in St. Louis. Majors: psychology and psycholinguistics. Code PO.

Etta Jane Pagani — Hometown: North Caldwell, N.J. Senior, George Washington University. Major: communication/business. Code P.

Larisa Aranbayeva — Hometown: New York City. Graduate, Gallaudet University. Bachelor's in accounting. Code CF.

Alan Lord — Hometown: Washington, D.C. Sophomore, Florida A&M University. Major: electrical engineering. Code EC.

Gilbert W. Loston III — Hometown: Houston, Texas. Junior, Prairie View A&M University. Major: finance. Code B.

Yolanda Bennett — Hometown: Woodbridge, Va. Second-year graduate student, master of public administration program, George Mason University. Code X.

(l to r): Eric Stehmer, Allison Barton, Kevin Somers, Dennis Hostetler, Jennifer Troxell, Erica Kinnear.

Photo credit: NASA/Renee Bouchard

Eric Stehmer — Hometown: Bowie, Md. Senior, University of Maryland, College Park. Major: history. Code E.

Allison Barton — Hometown: Stafford, Va. Sophomore, James Madison University. Major: business administration. Code Q.

Kevin Somers — Hometown: McLean, Va. Junior, Christopher Newport University. Major: computer engineering. Code YO.

Dennis Hostetler — Hometown: Mishawaka, Ind. Junior, Indiana University – South Bend. Major: computer science. Code M-4.

Jennifer Troxell — Hometown: Sterling Heights, Mich. Second-year graduate student, political science, American University. Code IQ.

Erica Kinnear— Hometown: Syracuse, N.Y. Senior, Pennsylvania State University. Majors: management science and information systems; information science and technology. Code CI.

(l to r): David Perez, Ashley Blacktree, Laurie Rodriguez, Anna Niles, Craig Cornelius, Jesse Small.

Photo credit: NASA/Bill Ingalls

David M. Perez — Hometown: Toa Baja, Puerto Rico. Junior, Universidad Interamericana de Puerto Rico. Major: aircraft system management. Code JP.

Ashley Blacktree — Hometown: Upper Marlboro, Md. Junior, Winston-Salem State University. Major: molecular biology. Code I.

Laurie Rodriguez — Hometown: Ocean City, N.J. Third-year graduate student, aerospace engineering, technology and policy, Massachusetts Institute of Technology; B.S., electrical engineering, Princeton University. Code BX.

Anna Niles — Hometown: Bel Air, Md. Second-year graduate student, budgeting, University of Wisconsin Madison; B.A., international relations, American University. Code BR.

Craig Cornelius — Hometown: San Diego, Calif. Graduate student, space policy, George Washington University; B.A., history of science, Princeton University. Code BX.

Jesse Small — Hometown: Waldorf, Md. Junior, University of Maryland – University College. Major: communications. Code IM.

Photo credit: NASA/Bill Ingalls

NASA VISION
AUGUST 2003

CATCHING A COMET'S TAIL IN EARTH'S ATMOSPHERE

For more than 20 years, NASA has flown high-altitude research aircraft to collect cosmic dust — debris of comets and asteroids that fills the inner solar system. In late April, though, they made the first attempt to collect dust particles from a very specific target — comet Grigg-Skjellerup — when Earth passed through the dust stream created by the comet as it flew around the sun.

Recently, scientists had no way of knowing the cosmic origin of the dust particles they collected. Using a computer model developed by Dr. Scott Messenger, a researcher in the Office of Astromaterials Research and Exploration Science at NASA Johnson Space Center, they were able to determine exactly when to fly in order to catch a piece of the comet they wanted to examine.

"In effect, NASA is exploring the solar system with airplanes," Messenger said.

Dust streams from comets are similar to those that produce meteor showers, but they are different in several important ways. The particles are much smaller than meteor particles; the dust streams hit Earth's atmosphere at much lower speeds, enabling the dust to survive entry into the atmosphere without melting, and these streams are very young.

This last aspect is what makes the comet dust particles possible to identify in the dust collections, even among a very abundant background of interplanetary dust. The fresher cometary dust particles can be identified by their lack of solar flare damage tracks and implanted gas from the solar wind. Dust particles from comet Grigg-Sjkellerup will be identified by a detailed examination of the collected samples, a process that could take years.